Abstract of the Disclosure

A method and an apparatus are provided in this invention to select an optimal swapping technique in $\underline{a}$ discrete multi-tone system. The algorithm for performing gain-swapping is also proposed in the present invention. A swapping technique is selected from gain-swapping and a combination of bit-swapping and gain-swapping based on two index values such that the difference between the maximum mean square error (MSE_{max}) and the minimum mean square error (MSE_{min}) is minimized and the gain factor constraints are met. The first index value I is representative of range of improvement when adopting the gain-swapping as the swapping technique, and the second index value J is representative of range of improvement when adopting a combination of the gain-swapping and the bit-swapping as the swapping technique.